

The Canadian Entomologist.

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THE ANNUAL ADDRESS OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

To the Members of the Entomological Society of Ontario :

GENTLEMEN,—Each revolving year brings its duties. To-day it is my privilege and a very pleasing duty to offer again to you a few words of encouragement, to refer briefly to some of the Entomological achievements of the past, and do what I can towards stimulating to further effort. The importance of the study of Entomology is yearly impressing itself more and more upon the public mind, as insect foes hitherto scarce become abundant, or as new ones invade our domain.

At present we are in danger from the approach of a new insect enemy which promises to give us a great deal of trouble. I refer to the new Carpet Bug, *Anthrenus scrophularie*. It was during the summer of 1874 that attention was first called by some of the newspapers in the Eastern States to the great damage being done to carpets in some of their cities on the sea-board by the ravages of an insect quite different from the well-known Carpet Moth, *Tinea tapetzella*, and far more destructive; one which would attack new carpets as readily as old ones, and devour their substance with such rapidity and persistence as to raise a doubt in some minds as to whether, in case this insect becomes generally prevalent, the use of carpets could be continued at all. Two years later this pest was found common in Schenectady, N. Y., when they were shortly brought under the notice of one of our most active and thorough workers in the Entomological field, Prof. J. A. Lintner, of Albany, N. Y., who at once proceeded to investigate the life history of the insect. Up to this time little or nothing was known here in reference to it, other than that the destructive creature was a larva of some sort, nearly oval in form and about three-sixteenths of an inch long, with the body clothed with short

hairs which were longer at each extremity. A number of these larvæ were collected and fed upon pieces of carpet, and their transformations carefully watched until the disclosure of the perfect insect, when it proved to be a member of that very destructive family of beetles known to Entomologists as the Dermestidæ. This insect, which proves to be a European species, has probably been imported from Europe with carpets brought to New York and Boston, at which ports its destructive efforts first attracted attention. The beetle, the parent of all this mischief, is a very small one, being not more than one-eighth of an inch long, and one-twelfth of an inch broad; it is nearly oval, black, with faint red and white markings. It does not confine its attention to carpets, but will eat any sort of woollen goods, but does not appear to injure those of cotton. In Europe it is said to destroy furs, clothes, collections of animals, insects and plants, and is sometimes very injurious to leather. A more detailed description of this insect and its workings, as furnished by Prof. Lintner's observations in his recent "Entomological Contributions," will be given in the annual report of our Society. As this insect has for some time past been committing great ravages in Buffalo, N. Y., it is not likely that we shall be long free from it; indeed it is altogether probable that it is already in our midst, although I am not aware that it has yet been brought under the notice of any of our Entomologists. Unfortunately it is a very difficult pest to destroy. The ordinary applications, such as camphor, pepper, tobacco, turpentine and carbolic acid, have, it is asserted, been tried without success, and no effectual means for its destruction has yet been devised.

Strange that so many of our most injurious insects have been brought from Europe, and that when introduced here they multiply to a far greater extent than in their native home. This rapid increase doubtless arises from the fact that they have numerous parasites in the place of their nativity which prey on them, and that these parasites are rarely imported with them, and hence it becomes a question of great practical importance as to whether these parasites might not by special effort be introduced, and thus materially lessen the losses which these scourges inflict on the community. We are indebted to Europe for the Codling Moth of the apple, *Carpocapsa pomonella*; the Currant Worm, *Nematus ventricosus*; the Oyster-shell Bark Louse, *Aspidiotus conchiformis*; the Cabbage Butterfly, *Pieris rapæ*; the Currant Borer, *Ægeria tipuliformis*; the Hessian Fly, *Cecidomyia destructor*; the Wheat Midge, *Diplosis tritici*; the Grain Wee-

vil, *Sitophilus granarius*; the Cheese Maggot, *Piophilæ casei*; the Cockroach, *Blatta orientalis*; the Meal Worm, *Tenebrio molitor*; the Bee Moth, *Galleria cereana*; the Carpet Moth, *Tinea tapetzella*; the Clothes Moth, *Tinea vestianella*; the Bacon Beetle, *Dermestes lardarius*, and several others of lesser note.

It cannot be denied that there has been some reciprocity in the matter. We have given Europe the noted *Phylloxera vastatrix*, which has inflicted damage to the extent of millions of dollars on the vineyards there; they have also received now from us the much-dreaded Colorado Potato Beetle.

During the past season we have had a fair share of destructive insects. The Forest Tent Caterpillar, *Clisiocampa sylvatica*, has again been numerous in the district about London and in many parts west of it, but not so abundant as last year. The severe frosts in May destroyed myriads of the very young larvæ then newly hatched, and later in the season there prevailed among the nearly full-grown larvæ in some localities a strange disease which carried them off by hundreds. I myself saw large numbers of them still retaining their hold on fences and tree trunks, which, when touched, were found quite dead, and so decayed as to burst with a very gentle handling. Very many have also been destroyed in the larval state by parasites; probably one-half or more will perish from this cause alone. Birds also have devoured many of them. On one occasion the crop of a black-billed cuckoo, *Coccyzus erythrophthalmus*, was brought to me packed entirely full of these larvæ. Even their clusters of eggs, which they deposit in rings upon the twigs of trees, are not free from attack. Last winter I discovered a species of mite preying upon the eggs and devouring them rapidly; many clusters were found entirely destroyed in this way, others partially so, and as each cluster would contain probably two or three hundred eggs, some idea may be formed of the benefits conferred upon us by these tiny mites.

The Colorado Potato Beetle is still spreading eastward through the Maritime Provinces, and has this year reached St. Johns, New Brunswick, but it is no longer the fearful evil at first anticipated, and our farmers battle with it confidently, knowing that with a little perseverance in the use of Paris green, they can ride victorious over this formidable foe. The use of this poisonous substance has provoked much discussion, and unnecessary alarm has been excited by some writers, who have expressed grave fears that the use of so much Paris green would eventually poison the soil

to such an extent as to render it permanently unfit for the growth of other crops. Several years ago Prof. W. K. Kedzie, of the Michigan Agricultural College, when experimenting in this direction, demonstrated that water charged with carbonic acid or ammonia dissolved a certain portion of the Paris green, but that this was quickly converted into an insoluble and harmless compound by combination with the iron which exists in almost every soil. As rain water always contains more or less of these ingredients, it is more than probable that the small portion of this poison used on potato fields soon loses its poisonous properties in this manner. In any case, one pound of the green spread uniformly over an acre of soil would only amount to less than one-sixth of a grain to the square foot, so that were the poison to remain unchanged, this minute portion might be added to the soil annually for a century without producing any perceptible deleterious effects on plant growth. It is to be regretted that any one should attempt to excite needless alarm in this way. Caution should be urged in handling this powerful poison, and it is often the case that more is used than is needed; these points are important and cannot be too often referred to. Paris green is best and most economically used with water in the proportion of one teaspoonful of the powder to a pailful of water, kept well agitated and sprinkled on the potato plants by means of a hand whisk dipped from time to time into the liquid. If the Paris green is pure this proportion is ample, but too often this useful compound is largely adulterated, a practice which some dealers are tempted to adopt from the eagerness with which a large portion of the public run after cheap goods. Paris green is frequently adulterated to the extent of from twenty-five to fifty per cent., chiefly with sulphate of baryta, a cheap and harmless mineral compound. By resorting to practices of this sort dishonest dealers can supply their customers at a less price than the cost of the pure article, and at the same time make large profits. It is a matter of regret that with an Adulteration Act in force, which if properly carried out would at once put an end to these and all such impositions, the public are not better protected.

The insect enemies of the Potato Beetle are in some localities rapidly increasing in numbers. In the annual report of our Society for the year 1871, our esteemed coadjutor, Mr. E. B. Reed, contributed an excellent article on the Potato Beetle, in which he enumerates a number of insects which prey upon this pest in the various stages of its growth, and among them refers to a species of *Lebia*, one of the active members of that family

of beetles known as Carabidæ, all of whom devour other insects. This species, *Lebia grandis*, is there said to be rare in Ontario. The first examples of this insect which I remember capturing were taken last year at sugar when trapping moths, and I believe it is the only species belonging to that family which I have ever taken in this manner; several of them were found feeding on the sweet liquid on dark nights about 10 o'clock. Early this fall I received a letter from Mr. W. E. Coldwell, of Constance, Ont., announcing the appearance in large numbers of a friendly insect, which was devouring the larvæ of the Potato Beetle, and proving a very effectual check on their increase. This letter was accompanied by specimens of the insect, which, to my gratification, I found on examination were examples of *Lebia grandis*. A few weeks later a farmer in this neighborhood called on me with the information that he had observed large numbers of an insect which he had not seen before, devouring the larvæ of the Potato Beetle. He brought no specimens with him, but from his description of the insect I have every reason to believe that it was the same *Lebia*. Since then I have occasionally met with examples of this friendly visitor hidden amongst the leaves of plants, a common place of resort for it during periods of inactivity.

The Hessian Fly, *Cecidomyia destructor*, which appeared in force in many counties of our Province last year, and which it was feared might again become a serious trouble, has happily almost disappeared. I have not heard of any serious loss from this pest during the past season. Should any of you desire, at any time, information in reference to the life history and habits of this insect, I would refer you to a very practical paper in our last annual report, by the Rev. C. J. S. Bethune; also to a more elaborate paper by the same distinguished Entomologist in our report for 1871.

The Cabbage Butterfly, *Pieris rapæ*, still continues its ravages, but does not seem to be quite so abundant this year as it was last. Water heated to near the boiling point has been used with success in destroying the larva, without injuring the cabbage. Strong decoctions of Cayenne pepper and Smartweed (*Polygonum*—?) have also been spoken highly of; but I look forward with far more confidence to a remedy provided by nature which is gradually making itself felt. I allude to that tiny little friendly parasitic fly, *Pteromalus puparum*, which is rapidly increasing in our midst. A few days since, while watching some of the full-grown larvæ of the Cabbage Butterfly which were feeding on Nasturtium leaves, I was much gratified in witnessing the method of attack which this parasite

adopts. Settling herself quietly down on the back of the caterpillar, near the terminal segments, with her head towards the caterpillar's head, she paused awhile; then with a sudden movement of her ovipositor, so quickly that the motion almost escaped detection, she thrust an egg under the skin of her victim. The caterpillar seemed startled, and quivering, jerked its head and anterior segments suddenly about, and then quieted again; the little tormentor meanwhile sitting perfectly composed on the spot where she first settled. Presently another thrust was made, followed by further uneasy movements of the larva, and in this manner, in the course of a very few minutes, quite a number of eggs were deposited. The caterpillar did not seem to be conscious of the cause of its troubles, nor, indeed, of the presence of its enemy, excepting when the thrusts with the ovipositor were made. On drawing a little nearer for the purpose of better observing this interesting operation, the tiny creature took alarm and flew off. Further examination revealed the presence of several more of these little friends, busily searching for further specimens to operate on. The eggs deposited soon hatch into little grubs, which eventually devour the body of their victim, and after it has entered the chrysalis state, eat small holes through the chrysalis, and thus make their escape. It has long been an unsettled point among Entomologists as to whether this parasite operates on her victim in the larval or chrysalis state, the weight of opinion being hitherto in favor of the view that the chrysalis is pierced and the eggs deposited in it; but from the observations here detailed it would appear that the eggs are usually, if not invariably, placed in the nearly full-grown larva.

At the same time I observed an insect belonging to the true bug family, Hemiptera, with its proboscis thrust into one of the same caterpillars, quietly sucking out its contents, the half-emptied victim vainly endeavoring to escape. As this bug was immature, I was unable to determine the species to which it belonged; it is pleasing, however, to know that there are several friendly helpers among the insect tribes aiding man in his efforts to subdue this obnoxious insect.

The Codling Moth of the apple is less abundant than usual this year, a scarcity which may be attributed to the early hatching of the moths during the very warm days of spring, and many of them perishing before the blossoms of the apple were sufficiently far advanced for them to operate on. Attention has been called again to the curious fact already noted in Europe many years ago, that the larva of this insect is sometimes

occupied by a strange parasite, a species of *Mermis*, known commonly as a hair-snake, a name probably due to the absurd belief, not yet quite extinct, that horse-hairs placed in water eventually become endowed with life, and change to hair-snakes. Several instances have occurred of late in the United States of these remarkable creatures being found in the interior of apples, where they had lived as parasites on the Codling worm, and having destroyed their host, remained in the fruit about the middle, where they were in danger of being eaten.

The Plum Curculio is no longer a stranger in that once famed plum-producing district of which Goderich is the centre. So plentiful has it become there now that some plum-growers are becoming quite discouraged and ready to give up the culture of the fruit entirely. This troublesome insect has not yet been reported from the Owen Sound district, where plum culture is still extensively and profitably carried on.

The importance of the study of Natural History in our schools, especially the branch of Entomology, is beginning to be recognized, and I trust the day is not far distant when every public school will have its museum of Natural History objects, where the children can be taught with the specimens before them the names and habits of the commoner mammals, birds, insects and plants with which they must constantly come in contact. Such studies would, in my opinion, strengthen the intellect and cultivate the memory and other faculties of the mind more thoroughly than many of the more abstract studies now specially designed for that purpose, while the practical value of such knowledge to the fortunate possessor in after life can scarcely be over-estimated. I am glad to state that at the Model Farm in Guelph the important study of insects injurious to agriculture is regularly taught with the aid of a very fair collection of specimens.

The meeting of the Entomological Club of the American Association for the Advancement of Science was held this year at St. Louis, where some very interesting papers on destructive insects were read, and some curious facts in reference to insect life elicited. Our Society was ably represented by a member of our Editing Committee, Mr. E. B. Reed. It will doubtless be a source of gratification to you to learn that your President has again been honored with the Vice-Presidency of that distinguished body of naturalists.

During the year some interesting additions have been made to our Entomological literature, which we can only now partially and briefly

enumerate. Among the most valuable are the "Entomological Contributions," by J. A. Lintner; "Descriptions of Noctuidæ," by A. R. Grote; "Food Plants of the Tineina, with Descriptions of New Species," by V. T. Chambers, both published in the Bulletin of the United States Geological and Geographical Survey; "Manual of the Apiary," by A. J. Cook; on "Sexual Dimorphism in Butterflies," by Samuel H. Scudder; also several papers by the same author on fossil insects found in the Rocky Mountains, and in the Tertiary Beds at Quesnel, in British Columbia; "Insects Injurious to the Cotton Plant," with many plates, by Townend Glover; "On the Butterflies and Moths of North America," by Hermann Strecker. Several additional numbers of Edwards' "Butterflies of North America" have appeared, each one rivaling or surpassing its predecessor in the exquisite beauty of the plates illustrating the species described.

The publications of our own Society have been creditably maintained. Our annual report to the Department of Agriculture for the past year has been very favorably noticed, and our CANADIAN ENTOMOLOGIST has been issued regularly, its pages being well filled, chiefly with the records of original observations. The contributors to our last volume numbered no less than forty-five, and included the names of nearly every Entomologist of note on the continent. During the year we have published two handsome lithographic plates, one on wood-boring beetles, illustrating eight species; the other, which is printed in colors, exhibits the full-grown larva of that rare and interesting moth, *Samia columbia*. Among the most valuable papers I would mention those of W. H. Edwards, on the preparatory stages and dimorphic forms of butterflies; and one by the same author detailing the notable discovery of secretory organs on the hind segments of the larvæ of *Lycaena pseudargiolus*, from which is discharged a sweet fluid which induces the attendance of ants, who in return for the sweets thus provided them, defend these larvæ from their enemies. Our pages have been enriched also by valuable papers on the Noctuidæ and Pyralidæ, by A. R. Grote; on gall insects and other subjects, by Dr. H. Hagen; on Tortricidæ, by C. H. Fernald; on Tineina, by V. T. Chambers, besides many others, which time will not permit me to enumerate. During the past three months we have published in three portions a translation from the German of a very valuable paper by Dr. A. Speyer, on the Genera of the Hesperidæ, which paper, we trust, will be the means of bringing about such a re-arrangement of the species contained in this interesting family of butterflies as will be acceptable to Lepidopterists, and

at the same time, one likely to be permanent. It is through the kindness of Prof. J. A. Lintner, of Albany, that this translation has been supplied to us.

The practice of capturing our night-flying moths by the method of trapping, known to Entomologists as "sugaring," is still persevered in by most of our more active members, and with great practical results. Species which formerly were regarded as the greatest rarities have in many instances been taken in large numbers, while many new discoveries have rewarded the most persistent workers in this interesting field of research. As an example of the results of such work we would refer to a paper published in the CANADIAN ENTOMOLOGIST for November, 1877, on "Catocalæ Taken at Sugar, at Center, New York," by Dr. James M. Bailey.

During the past year that talented and energetic Entomologist, Prof. Townend Glover, of Washington, has, in consequence of ill health, been obliged to resign his position as Entomologist in the Department of Agriculture. While deeply regretting the cause which necessitated the change, I am pleased to be able to record the graceful recognition of the importance of Economic Entomology by the heads of the Department in Washington, in appointing Prof. C. V. Riley to fill this high position, a man who has done so much by his valuable reports as State Entomologist of Missouri to popularize Entomology and to disseminate practical information in reference to our insect pests throughout this continent.

In our last annual report reference was made to the appearance of the first of a series of practical works on Economic Entomology by that renowned Entomologist, Andrew Murray, F. L. S., of South Kensington Museum, London, England. This work treated of some of the lower forms of insect life and their allies, and was to have been followed by seven additional volumes, all having a practical bearing on this subject, so important to the agriculturist. I then expressed the hope that this talented author might be spared to complete the series of useful works proposed, and thus leave behind him a lasting monument of his industry and devotion; but not long after this the sad news reached us that he had ceased from his labors—that he had been called away by death. Thus "man proposes but God disposes." It is commendable to lay our plans for usefulness in life, and to labor as opportunity offers with diligence, knowing that our time is short, and that the most useful life will soon—as far as this world is concerned—be at an end; but I love to think that when our work here is done, our happy lot may be to find in a purer state

new fields of labor, where, free from the impediments which now obstruct our progress, we may study with much greater advantage the wonderful works of the Infinite Creator.

Thanking you for your kind attention,

I remain, yours very sincerely,

WM. SAUNDERS.

ANNUAL MEETING OF THE ENTOMOLOGICAL CLUB OF
THE AMERICAN ASSOCIATION FOR THE ADVANCE-
MENT OF SCIENCE.

(Concluded from September No.)

August 21st, 1878.

The Club met in the same place at 3 o'clock p. m., the President in the chair.

There was a much larger attendance than yesterday of members and those interested in Entomology.

The first order of business was the reading of the report of the special committee appointed yesterday. Mr. Reed presented the report.

The committee to whom was referred the question of the constitution of a quorum beg to report as follows :

Whereas it is most desirable in the interest of the Club that a definite and permanent character should be given to all its proceedings, and that nothing should be left undone which would tend to establish complete confidence in the manner of transacting the business of the Club,

Your committee therefore recommend that the constitution be amended by providing

(1) That no business of the Club shall be transacted unless there are present a quorum of ten persons, who shall have been enrolled as members of the Club at least one year previous to the then session.

(2) That when motions shall have been carried by the Club, the same shall not be rescinded at any subsequent meeting unless there be present as many members as were present at the date of passing such motions.

Your committee recommend that this report be printed and a copy sent to each member of the Club, and that it be brought up for discussion at the next annual session of the Club.

August 21, 1878.

C. V. RILEY,

A. G. WETHERBY,

E. BAYNES REED.

The report was unanimously adopted.

The Club then proceeded to the election of officers.

On motion, duly carried, the following gentlemen were re-elected officers for the ensuing year :

Mr. J. A. Lintner, Albany, N. Y. - President.

Mr. Wm. Saunders, London, Ont. - Vice-do.

Mr. B. Pickman Mann, Cambridge, Mass. - Secretary.

The President returned thanks for the honor conferred upon him. He then addressed the Club, giving a most interesting description of the success that had attended his efforts and those of his co-laborers in collecting Noctuidæ during the season of 1877, by the means known as "sugaring." By reference to a list given on page 120 of his "Entomological Contributions," No. 4, it would be seen that there had been captured eighty-six species, not one of which had hitherto been taken in the Albany district. Nearly all of these had been found in the famous Center locality. He most graphically described his manner of working by this method, and strongly recommended its trial to all the members.

Prof. Wetherby made some remarks on this attractive means of capture, which was continually bringing under the notice of Entomologists specimens hitherto unknown or considered as most rare. It was a question if there were any species which are in reality rare, their seeming rarity resulting from our not knowing when, where and how to collect them.

Miss Smith described a collecting bottle of her own device, by which, on touching a spring, the cover flew back and the insects could be readily caught in the receptacle. Its chief recommendation was that it could be managed by one hand, leaving the other at liberty for holding the lantern.

Mr. Reed advocated the fastening of the lantern to the waist by a belt, thus leaving the hands at greater freedom to use the bottles and boxes.

The President said he had found that in using the ordinary bulls-eye lantern the fingers could be thrust through the wire handle in such a manner that their ends and the thumb were free for use in withdrawing, hold-

ing and replacing the stopple of the collecting bottle. The lantern in hand enabled him more readily to adjust the light, and he had found that it was often more desirable to throw the penumbra rather than the full light upon the tree, many insects often fleeing from a strong light.

Miss Smith gave an account of the damage done to the oaks in Wisconsin and Illinois by the larvæ of a little Tortrix, *Argyrolepiæ quercifoliana* Fitch.

A very interesting discussion took place on the question of instinct or reason displayed by insects, and many curious instances were cited proving that instinct and reason differ in degree and not in kind.

The meeting then adjourned.

LECANIUM TULIPIFERÆ.

BY A. J. COOK, LANSING, MICH.

On page 218 of the "Revised Manual," in speaking of other sources than flowers from which bees collect sweets, I remark that I have seen the bees thick about a large bark-louse, which attacks and often destroys one of our best honey-trees. This is an undescribed species of the genus *Lecanium*.

In the summer of 1870, this louse, which, as far as I know, has never yet been described, and for which I propose the above very appropriate name, *tulipiferæ*—the *Lecanium* of the tulip tree—was very common on the tulip trees about the College lawns. So destructive were they that some of the trees were killed outright, others were much injured, and had not the lice for some unknown reason ceased to thrive, we should soon have missed from our grounds one of our most attractive trees.

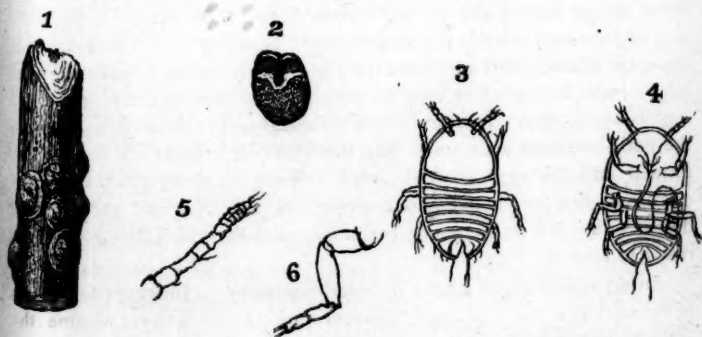
Since the date above given I have received these insects, through the several editors of our excellent bee papers, from many of the States, especially those bordering the Ohio River. In Tennessee they seem very common, as they are often noticed in abundance on the fine stately tulip trees of that goodly State. In the South this tulip tree is called the pop-

lar, which is very incorrect, as it is in no way related to the latter. The poplar belongs to the willow family; the tulip to the magnolia, which families are wide apart.

Wherever the tulip-tree lice have been observed, sucking the sap and vitality from the trees—there the bees have also been seen, lapping up a sweet juicy exudation, which is secreted by the lice. In 1870 I observed that our tulip trees were alive with bees and wasps, even as late as August, though the trees are in blossom only in June. Examination showed that the exuding sweets from these lice were what attracted the bees. This was observed with some anxiety, as the secretion gives off a very nauseating odor.

The oozing secretions from this and other lice, not only of the bark-louse family (Coccidæ), but of the plant-louse family (Aphidæ), are often referred to as honey-dew. Would it not be better to speak of these as insect secretions, and reserve the name honey-dew for sweet secretions from plants, other than those which come from the flowers?

The fact that this insect is yet undescribed—that it attacks one of our best honey trees, and is the source of a so-called honey-dew, leads me to append the following description, with illustrations.



NATURAL HISTORY OF THE *LECANIUM TULIPIPERÆ*.

The fully developed insect, like all bark-lice, is in the form of a scale (fig. 1), closely applied to the limb or twig on which it works. This insect, like most of its genus, is brown, very convex above (fig. 1), and concave beneath (fig. 2). On the under side is a cotton-like secretion,

common to all of the genus *Lecanium*, which serves to enfold the eggs. Underneath the species in question are two transverse parallel lines of this white down (fig. 2); one of them, probably the anterior, is nearly marginal, and is interrupted in the middle; while the other is nearly central, and in place of the interruption at the middle it has a V-shaped projection back or away from the other line. The form of the scale is quadrangular, and not unlike that of a turtle (fig. 1). When fully developed it is a little more than 3-16 of an inch long, and a little more than $\frac{2}{3}$ as wide.

Here at Lansing, the small, yellow, oval eggs appear late in August. In Tennessee they would be found under the scales in their cotton wrappings many days earlier. The eggs are 1-40 of an inch long, and 1-65 of an inch wide. These eggs, which are very numerous, hatch in the locality of their development, and the young or larval lice, quite in contrast with their dried, inert, motionless parents, are spry and active. They are oval (figs. 3 and 4), yellow, and 1-23 of an inch long and 1-40 of an inch wide. The eyes, antennæ (fig. 5) and legs (fig. 6) are plainly visible when magnified 30 or 40 diameters. The 9-jointed abdomen is deeply emarginate, or cut into posteriorly (fig. 3), and on each side of this slit is a projecting stylet or hair (figs. 3 and 4), while from between the eyes, on the under side of the head, extends the long recurved beak (fig. 4). The larvæ soon leave the scales, crawl about the tree, and finally fasten by inserting their long slender beaks, when they so pump up the sap that they grow with surprising rapidity. In a few weeks their legs and antennæ disappear and the scale-like form is assumed. In the following summer the scale is full-formed and the eggs are developed. Soon the scale, which is but the carcass of the once active louse, drops from the tree, and the work of destruction is left to the young lice, a responsibility which they seem quite ready to assume.

In my observations I have detected no males. Judging from others of the bark-lice, these probably possess wings, and will never assume the scale form, though Prof. P. R. Uhler writes me that some of the males are apterous. He says that it is very important to know and record the males, and that the genera are hardly determined without them.

REMEDIES.

If valued shade or honey trees are attacked by these insatiate destroyers, they could probably be saved by discrete pruning—cutting off

the infected branches before serious injury was done, or by syringing the trees with a solution of whale oil soap,—or even common soft soap would do—just as the young lice are leaving the scales. It would be still better to have the solution hot. Whitman's Fountain Pump is admirable for making such applications.

Fig. 1 is slightly magnified; the others are largely magnified. The drawings were made from the objects by W. S. Holdsworth, a senior of the Michigan Agricultural College.

DESCRIPTION OF TWO NEW SPECIES OF CATOCALA.

BY A. R. GROTE, BUFFALO, N. Y.

Catocala Beaniana, n. s.

Intermediate between *Briseis* and *Meskei*. Fore wings paler than *Briseis*, with the t. p. line more dentate, and the brown subterminal shade paler; sub-reniform open. Hind wings red like *Meskei*, the middle black band broader, interrupted, transverse and not like *Briseis*, where it is still broader, continued and rounded, not so straight across the wing. Beneath much like *Briseis*, with the black bands broader and the white interspaces narrower than in *Meskei*. The subterminal white dentate shade on the primaries above more dentate than in *Briseis*. This species is similarly sized with *Briseis*, and is best described comparatively with that species and *Meskei*. Sent me by Mr. Thomas E. Bean, under the number 574, from Illinois.

Catocala Westcottii, n. s.

♂ ♀. Allied to *anna*, but smaller, with pale yellow hind wings and continuous bands, the median band angulated inferiorly and not so constricted superiorly as in that species. The primaries closely resemble *anna* in markings; the black outer shade of the t. a. line is quite similar and approaches *anna* and *Westcottii* to the group of *nuptialis*, *abbreviatella* and *Whitneyi*. Beneath the pale yellow outer interspace is narrower in *Westcottii*, and there is no basal black ray on secondaries, which show the

black reniform mark on the disc as in *anna*. The mesial black band is subcontinuous and proportionately broader in *Westcottii*. Above the markings of fore wings are very similar in the two species; the tone is a little darker in *Westcottii*. The female expands 50, the male 43 mil. I have the male from Illinois, Mr. Bean, number 577; the female from Wisconsin, Mr. O. S. Westcott, for whom I name the species.

DESCRIPTION OF TWO NEW CALIFORNIAN BUTTERFLIES.

BY THEODORE L. MEAD, NEW YORK.

Chionobas Ivallda, n. sp.

MALE—Expanse $1\frac{5}{8}$ to $2\frac{1}{8}$ inches, average $2\frac{1}{8}$ inches. Upper side of primaries fuscous, with velvety discal bar and a submarginal row of gray-ochraceous spots between the nervures. These spots are usually six in number, situated in the consecutive interspaces between the nervures, beginning with the last but one subcostal interspace, counting from the apex of the wing. The second of these spots always contains a black ocellus, pupilled with white. On the fifth interspace (last median) are usually faint indications of a fuscous dot in about one-third of the specimens examined; in one instance this dot is distinct and pupilled with white.

The ochraceous spots are not sharply defined unless very well developed; their length is not more than one-third that of the inner margin of the wing; in breadth they sometimes occupy the whole interspace, leaving only a narrow border of fuscous on the nervule, while sometimes they are almost obsolete. The spots are always truncated on a line nearly parallel to the outer margin of the fore wing, thus leaving a fuscous border.

Costa mottled with gray and fuscous.

Secondaries gray-ochraceous with a fuscous border, usually with a pupilled ocellus in the second median interspace; this is occasionally obsolete. Nervures more or less distinctly fuscous.

Under side—Primaries gray-ochraceous, the pupilled spot or spots of the upper side shown more distinctly; the costa and apex mottled pale

gray and black. A distinct fuscous band as in *Chryxus* crosses the wing; it has a sharp tooth extending out on the upper branch of median nervule and occasionally one also in the last median interspace. Within this band is another, less distinct and often partly obsolete, but corresponding with the inner crenate band of secondaries. Near the outer margin is a border of sprinkled fuscous scales, condensed inwardly to a line which is nearer the margin than the similar one in *Chryxus*. The cell is closed by a bar of dark fuscous.

Ground color of secondaries gray with a tint of ochraceous, mottled with black; the ocellus of the upper side is always more distinct, even when absent above it is indicated below. The usual band of secondaries is as a rule distinct, though sometimes hardly distinguishable from the other mottling of the surface; as in *Uhleri*, the border is crenulate, quite variable as to the depth of the crenulations; the inner border with a sinus where it crosses the median nervure, in these respects much like *Chryxus*.

FEMALE—Expanse $2\frac{1}{16}$ to $2\frac{1}{8}$ inches. Primaries ochraceous above; the band of under side shown distinctly in fuscous, its tooth on upper branch of median nervure very noticeable; the nervures fuscous. Costa and outer margin rather broadly bordered with grayish fuscous; this border usually becomes obsolete near the angle of the wing, except a narrow line at the margin, which is always dark fuscous.

The two ocelli mentioned in the description of the male are always present in the female; usually also another on either side of the lower ocellus—in that case four in all.

Secondaries as in the male.

Margins of the fore wings entire, of the hind wings slightly crenulate in the male, decidedly so in the female; fringes fuscous cut with white.

C. Ivallda is distinguished immediately from *Chryxus* by the pale color; there is no trace of the fulvous tint shown by most of our Western species of *Chionobas*. The color, in fact, is almost exactly that of the curious *Hipparchia Ridingsii*, which has not only the appearance, but the habits of a *Chionobas*.

C. Ivallda is here described from 39 ♂ 8 ♀, one pair of which were taken by Mr. Morrison at Summit, and the rest by myself on Freel's Peak and Tallac Mountain, all three localities being within a few miles of Lake Tahoe, near the boundary line between California and Nevada. They

were taken during the latter part of July and early in August, at an elevation of nine to ten thousand feet above the sea.

This species is local and I believe extremely rare in most parts of its habitat. In a very thorough exploration of the mountain crests about Summit I found none; I camped for two days on Freel's Peak for the express purpose of hunting this species, my father assisting me in the search; although it seemed a favorable locality, but five specimens were taken, all males. On the grassy northern slope of Tallac Mountain, however, we were more successful, and by returning thither and again camping, a good series of specimens was obtained.

Chrysophanus Editha, n. sp.

Group of *Xanthoides* and *Dione*. Expands $1\frac{1}{4}$ to $1\frac{1}{3}$ inches.

Male fuscous above, narrowly edged with black along the outer margin, and with black discal bar; the usual spots show through very faintly on the upper side. Hind wings fuscous, with similar black edge, and within this a row of four or five black spots near the anal angle. The two nearest this angle are surrounded by an irregular ochraceous line. Under side of fore wings gray inclining to fuscous, cinereous on the disc, with the black spots as in allied species. Hind wings below gray-fuscous clouded with white. A rather broad band of gray-fuscous occupies the outer margin; this band is crenated inwardly and cut by a fulvous line which begins on the abdominal margin, extends out on the submedian and last branch of median nervules, thus leaving a white, black-pupilled half-ocellus at anal angle, a large gray-fuscous crescent in the next interspace, and next to this a white, black-pupilled ocellus; in this respect the present species resembles *Xanthoides*, and differs from *Dione*, which has much more fulvous. At the inner edge of the gray-fuscous band the white clouding is condensed into a continuous line of broad lunules, and at the inner border of this is the row of spots always found in this genus; these spots are quite large, pale gray-fuscous, edged with black and surrounded by white; the discal bar is usually confluent with the dot within the cell, so as to form an irregular horse-shoe mark.

Fringes of all the wings composed of scales of two lengths, the upper and shorter set being nearly black, the lower ones white; sometimes the black scales are a little longer in certain places, thus making the fringe seem white cut with black.

The last branch of median nervule of hind wings prolonged into a very slight tooth; this is more distinct in the female, being there about as in *Xanthoides* ♂.

The female differs from the male in always having at least a small fulvous or ochraceous cloud upon the disc of fore wing, and a similarly colored streak at the outer angle. The cloud upon the disc is sometimes so extended as to cover half the surface of the wing. The spots of lower surface are rather distinctly shown above. In the middle of secondaries there is often an irroration of fulvous scales and a distinct scalloped fulvous line along the outer margin, enclosing a black crescent, or double dot near anal angle and smaller dots above.

Under side like the male, but brighter, and with markings more distinct; a fulvous tint is also seen at outer angle of primaries.

This pretty little species may be distinguished from *Xanthoides*, its nearest ally, by its smaller size, the much more convex outer margins and more rounded outer angle of primaries, the blunter tooth of secondaries, the white clouding below and the large size of all the spots.

Described from thirty-three specimens, ♂ and ♀ in about equal numbers, taken on the borders of Lake Tahoe, near Carnelian Bay, on the 26th of July. In a stay of some weeks around Lake Tahoe, during which I was constantly collecting, this species was only once met with, then appearing in considerable numbers and easily taken on the flowers of Yarrow (*Achillea millefolium*), which is already a common weed in many parts of California.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The eighth annual meeting of the above Society was held at the residence of Mr. Wm. Saunders, on the evening of the 20th Sept., 1878. The President, W. Saunders, in the chair. Letters of apology for non-attendance were read from the following members of the Council: Jas. Fletcher, Ottawa; J. G. Bowles, Montreal, and J. Pettit, Grimsby. The President also reported that in consequence of removal to Montreal, Mr. J. Williams had been obliged to resign the office of Secretary-Treasurer.

The report of the Montreal Branch was read by the Secretary, showing that organization to be in a prosperous condition, and the members active in the work of promoting Entomology in Canada. On behalf of the Council of the parent Society, Mr. Saunders reported a number of valuable acquisitions to the Library.

The President then read his Annual Address, after which a vote of thanks was tendered, coupled with the request that a copy be furnished for publication in the ENTOMOLOGIST.

The election of officers next took place, with the following results:—President, Wm. Saunders, London; Vice-President, Rev. C. J. S. Bethune, Port Hope; Secretary-Treasurer, Jas. H. Bowman, London. Council—E. B. Reed, London; Wm. Couper, Montreal; J. Pettit, Grimsby; J. M. Denton, London; Rev. R. Burnet, London; G. J. Bowles, Montreal; Jas. Fletcher, Ottawa, and R. V. Rogers, Kingston. Editor, W. Saunders, London. Editing Committee—Rev. C. J. S. Bethune, Port Hope; E. B. Reed, London; G. J. Bowles, Montreal, and Rev. R. Burnet, London. Librarian, W. E. Saunders, London. Library Committee—E. B. Reed, J. M. Denton, H. B. Bock, with the President, Librarian and Secretary-Treasurer. Auditors, Messrs. Chas. Chapman and A. Puddicombe.

Succeeding the business portion of the meeting, an interesting and instructive hour was spent in the microscopic examination of insects and plants with the aid of three excellent microscopes belonging to Messrs. Puddicombe, Denton and Saunders. Among the objects of special interest were egg clusters of *Clisiocampa sylvatica*, with mites at work destroying the eggs; mounted specimens of the new Carpet Bug, *Anthrenus scrophulariae*, and of the parasite on the Cabbage Butterfly, *Pteromalus puparum*.

IMPORTANT ANNOUNCEMENT.

In consequence of removal, our late Secretary-Treasurer, Mr. J. Williams, was obliged to resign his office. Our correspondents will please bear in mind that in future all business communications should be addressed to his successor, Mr. Jas. H. Bowman, London, Ont.

